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Adoption intention and usage behaviour of mobile travel apps: integration of trust, and technology acceptance model with social cognitive theory

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Abstract: Due to the recent development of new technologies, travel-based organisations worldwide are continually adopting user-friendly mobile travel apps to provide tourists with multidisciplinary service benefits. This study evaluates factors affecting young consumers' mobile travel apps' actual usage, where variables are taken from social cognitive theory and technology acceptance model. Using a cross-sectional survey, relevant data generated from 386 consumers who resided in Chattogram, Bangladesh. Related hypotheses are developed and validated, employing the partial least squares technique utilising SmartPLS 3.0. Results suggest that perceived ease of use, self-efficacy, social norms, and trust are significant precursors of the intention to use travel booking apps. In addition, the intention to use mobile travel apps is a significant precedent for young consumers' mobile travel apps usage behaviour. In this study, the integration of theory and practice will help academicians and professionals to explore a viable solution to a demanding issue in the tourism industry.

Keywords: mobile travel apps; perceived usefulness; perceived ease of use; PEU; self-efficacy; social norm; trust; actual usage.

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1 Introduction

In the 21st century, smartphone, considered as sophisticated technology, has brought a wonderful solution to meet social needs and radically transformed the behaviour of consumers in particular and the socio-economy as a whole. Nowadays, applications, commonly known as apps, installed in a smartphone have brought substantial changes in life, which includes improved connectivity with friends and family, better productive use of leisure time, increased time to browse for information, and greater reliance on smartphones for other purposes (Amankwaa and Blay, 2018). In many daily activities, smartphone apps offering a wide variety of utilities are anticipated to transform how people make different decisions in life and carry out various tasks (Zong and Zhang, 2019). Recently, smartphones with its applications have been gradually advanced in the tourism industry, as travellers are increasingly using smartphone applications that provide them with the opportunity to access knowledge, social media platforms, location-based services, entertainment, and other helpful resources to gather information about the tourist destination and schedule their journey more efficiently (Wang et al., 2016). Travellers are using mobile travel apps for searching travel-related information, booking accommodation, confirming transportation facilities, exploring destination-specific information that would affect users continued usage intentions differently (Choi et al., 2019). Undoubtedly, the mix of smartphone applications would enable visitors to use their smartphones more extensively. Considering the fact of the competitive market mechanism, travel and tourism companies around the world have introduced an innovative strategic framework by applying user-friendly mobile travel apps to offer multidimensional types of service benefits to the traveller, thereby build and maintain beneficial exchange relationships purposively to meet the expectations of the existing and potential target group.

Mobile travel apps can be defined as smartphone applications to fulfil visitors' specifications at multiple levels, from pre-travel to post-travel (Lu et al., 2015). It is considered as one of the most recent modified information technology (IT)-based smart tourism platforms (Zhang et al., 2019), which comprise popular applications that are directly aimed at travellers and other stakeholders in widespread tourism contexts. In perspectives of tourism, it is significantly ensuring and enhancing the active engagement of users in smartphone technologies. With the help of travel booking apps, tour operating companies enjoy excellent opportunities to understand diverse customers' needs and enable them to take full advantage of severing tourists by collaborating networks with tourists from diverse locations in a better sophisticated customised way with economic of scale, thereby enhance relational resources (Samy, 2012). Mobile travel apps with its rising number of active users in the younger generation and a broad spectrum of

applications on the digital platform are quickly being embraced as a tourism atmosphere for understanding the transportation and tourism network, based on its redefined computational power and pervasiveness (Dickinson et al., 2014).

Over the last few years, the percentage of international travellers in developing countries has almost dramatically increased from the perspective of the overall tourism industry. Out of the 1,461 million arrivals in 2019 concerning international tourist arrivals, 685 million were from developing countries with a portion of 46.9%, where the percentage of South Asia was 2.4%, which becomes nearly doubled compared to the market share (1.54%) in 2010 (UNWTO, 2020). Thus, it seems apparently true that the prediction of UNWTO considering tourism destinations in developing economies would rise at a twice level than that of advanced economies (Goffi et al., 2019). Again, in most fast-growing emerging countries, mobile apps have become very widely available among young consumers (Mahapatra, 2017; Mehra et al., 2020). As they have advanced access to education compared to their previous generation, they are found competent, knowledgeable, and updated about tech-based products and services (Rageh Ismail and Spinelli, 2012). Moreover, they appear to be early adopters of more advanced and comprehensive users of mobile applications (Halewood and Kenny, 2008; Sarkar and Sarkar, 2019). Young consumers, the most involved cohort in the digital platform, may therefore be viewed as a pertinent and growing part of tourism adopting mobile travel apps in contrast with older folks. However, this category of tourists is frequently undermined by the mass consumer and adolescent tourists category as there is a common misconception that most young people have a tight budget and lower socioeconomic status (Han et al., 2017). On the other hand, mobile travel apps remain at the very preliminary stage from a research gap standpoint, and very little has been explored about tourists' engagements towards mobile-based applications (Lu et al., 2015; Wang et al., 2016). Moreover, in the tourism industry, the key features of smartphone technology research regarding market applications, along with theoretical underpinnings, are also not clearly established (Law et al., 2018). As more businesses and organisations are continuously investing in tourism-based applications, customer adoption and trust become essential to ensure a greater return on investment and improve the likelihood of integrating the latest technology successfully (Lu et al., 2015).

In this study, the main objective is to assess the major variables affecting young consumers ' behavioural intention towards using mobile travel applications and formulate a conceptual model elucidating the usage behaviour of mobile travel applications. This study, thus, seeks to fill the gap in the current literature by examining the expectations that young consumers have about this advanced technology. In order to evaluate consumer behaviour regarding the general use and application of innovative technological resources, numerous human behaviour philosophies, along with deliberate models, have been introduced by several scholars with scientific literature over the last few decades. Due to the growing importance of recognising online consumer behaviour, this research has incorporated attitude-behaviour frameworks and developed a new model focusing on cognitive psychology by utilising the social cognitive theory (SCT) (Bandura, 2001) along with technology acceptance model (TAM) (Davis et al., 1989). This research study is subsequently structured in the following way. First, the literature on the TAM and SCT is evaluated with an emphasis on tourism pertinent to this article. Second, the research hypotheses emerged from the literature review, and their association to mobile travel apps are mentioned. The next section discusses the methodology for analysing the hypotheses in terms of the statistical analysis and research approach utilised

in the study, along with the results of the analysis. In conclusion, part limitations were included along with mentioning the theoretical and managerial implications of mobile travel apps usage behaviour in the developing country perspective. This contributes to a section describing the scope for future research focusing on mobile travel apps based on digital advancements.

2 Literature review

2.1 Technology acceptance model

TAM is a widely used philosophy aimed at explaining the adoption of technology and consumer behaviour (Davis, 1989). The theory of reasoned action proposed by Ajzen and Fishbein (1977), where the thought of TAM was initially introduced (Davis, 1989) to understand the usage of technology, and subsequently, it was extended to explain the application of technology in other contexts, such as internet user behaviour and telecommunications network usage (Kumar and Mukherjee, 2015; Lin, 2011). TAM has been deemed as the most balanced, explicable, and powerful model of consumer adoption behaviour, which delivers technology process developers insights into which particular roles or attributes drive the continued usage of technology (Huang and Ren, 2020; Pavlou, 2003). This research adopted TAM (Davis, 1989) as a philosophical model that is not only logically consistent but also has substantial methodological validation, including numerous previous tourism research studies (Kim, 2016; Matikiti et al., 2018; Morosan, 2012, 2014). The TAM reveals that consumer technological know-how is associated with two main beliefs, notably perceived usefulness (PU) and perceived ease of use (PEU) (Lu et al., 2015; Pindeh et al., 2016). PU is the rational estimation of the potential benefit and motivation obtained by the user through modern technological innovation (Go et al., 2020), where PEU is the sum of cognitive interaction needed to understand a modern technological innovation and then use it (Gefen et al., 2003a). TAM uses these two variables (PU and PEU) to forecast consumers' final decisions when investigating their motivations and behaviours for adopting (or rejecting) new technical developments (Do et al., 2020). If the technological system is practical and easy to understand, the consumer would have a favourable experience with it, which would ultimately enhance the desire of the consumer to adopt it (Lu et al., 2015). TAM argues that individual behavioural intention is the outcome of a cognitive mechanism through which a favourable response is utterly developed (Noh and Lee, 2016; Pindeh et al., 2016).

2.2 Social cognitive theory

SCT, being one of the most influential concepts, which derives from the philosophy of social learning, has been familiar as a rigorous analytical paradigm for the study of human behaviour (Bandura, 1986). It is regarded as a human behaviour philosophy with evidenced-based concepts with broad applicability (Bandura et al., 1999). It also establishes a framework for analysing, predicting, and altering human behavioural actions (Cai and Shi, 2020). The variables of SCT that have been considered in this analysis are self-efficacy (SE), individual perceptions of results, and encouragement for the enhancement of social relations and behavioural actions of the specific activity. The SCT has been applied in a broad arena, most considerably in assessing diverse human

behaviour, possibly due to its inherent flexibility (Boateng et al., 2016). It has been commonly used throughout adopting technological advancement (Boateng et al., 2016), sustainable tourism (Font et al., 2016), uses, and advantages of the internet (LaRose and Eastin, 2004). Under SCT, SE reflects an individual's confidence in the ability to undertake particular actions (Bandura et al., 1999), which is known to be the focal predictor of activity-based behaviour (Bandura, 2004). In addition, social encouragement is an ecological consideration as to how and to what degree others find it easier for a person to participate in a particular behaviour (Wang and Dai, 2020).

According to the TAM And SCT, the pinpoint in this analysis is that the adoption of a specific technology will be influenced by individual atmospheric advancement and awareness, the confidence of what modern technology can develop personal and surrounding influences and encouragement through people's intention to use travel booking apps. The next section addresses both of these principles further by illustrating the conceptual research framework for research hypotheses in the context of travel booking apps.

2.3 Research framework

2.3.1 Perceived usefulness

PU refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" [Davis, (1989), p.320]. PU is associated with the anticipated cumulative effect of technology (Camilleri and Camilleri, 2019), which has a significant influence on an individual's decision to use so on the real use of technologies (Davis, 1989). Suki and Suki (2017) disclosed that PU impacts the user's behavioural intention in aviation reservation through smartphone applications. Lu et al. (2015) found that the PU of application of travel has a major positive significant impact on intention of using mobile travel apps. Kim (2016) wants to know the customer views of hotel tablet applications and concluded that PU of hotel apps have a significant positive influence on customers' willingness to use the app. Huang and Ren (2020) found in their studies that PU has a positive and significant relationship with users' intention to continue using mobile fitness apps of 499 users in China. Li and Chen (2019) found that the PU of virtual reality has a significant and positive relationship with the intention to travel tourists. When PU is strong, consumers feel that technologies can assist them in enhancing their work output and thus increasing their desire to use technology (Chen and Tsai, 2019). From the above literature, the following hypothesis can be developed:

H1 PU is positively associated with young users' behavioural intention to use travel booking apps.

2.3.2 Perceived ease of use

PEU refers to the degree where an individual assumes that technological innovation is customer-friendly and simple to be using (Camilleri and Camilleri, 2019). If consumers find technological innovation like TA is complicated, tedious, technically challenging, and/or time-intensive, the innovation is most likely to be refused. As a consequence, whether they feel uncomfortable, apprehensive, or afraid of using technological features, they would not be effective and profitable (Camilleri and Camilleri, 2017). Chen and Tsai (2019) wanted to know the behavioural intention to use customised destination-based

smartphone tourism applications and found that PEU has a significantly positive relationship with the intention to use destination-based tourism apps. Vishwakarma et al. (2020) found that customers' perceptions of how easy it is to use virtual reality have a positive impact on their desire to use virtual reality to experience a destination before going there. Tam et al. (2020) wanted to explore the factors that influenced the continuance intention of using smartphone apps and found that PEU has a significant positive relationship with the intention of using mobile apps.

While several scholars have indicated that PU is a more significant component than PEU to decide the thoughts and actions of users towards a particular technology (Davis, 1989; Shaw, 2014), users will not want to consider using technology unless it is convenient to use (Akroush et al., 2020; Morosan, 2012). Mathew and Soliman (2021) found that the PU of adopting digital content marketing of consumer behaviour in tourism is positively influenced by PEU. Hahn et al. (2014) wanted to forecast the behavioural intentions of consumers for using tourism apps, especially for particular age categories that are frequent travellers with heavy smartphone users, and found that PEU positively and significantly influences the PU of tourism applications. Haldar and Goel (2019) investigated Indian passengers' reluctance to use car-sharing applications and found that PEU has a positive and significant association with the PU of car-sharing applications. Leon (2018) explored in their studies that PEU is a significantly positive influence on PU and intention to use mobile apps among the customers who are born between 1980 to 2004. Therefore, the following hypothesis can be proposed from the above discussion:

H2 PEU is positively associated with the young users' behavioural intention to use travel booking apps.

H3 PEU is positively associated with PU.

2.3.3 Self-efficacy

As a core component of the SCT, SE describes as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" [Bandura, (1991), p.257]. As a crucial self-assessment tool that acts as the basis for human behavioural transformation, SE impacts people's decision-making on the intensity of motivation to participate in an activity and how long to persistence in the view of barriers (Bandura, 2012). Individuals with elevated SE are more likely to see complicated tasks as challenges to be managed rather than deferred (Shu et al., 2011). Shankar and Datta (2018) wanted to know factors that affected the intention of paying payment through mobile and found that SE has a substantial positive impact on the adaptation intention of mobile payment. Singh and Srivastava (2018) wanted to identify the factors impacting the acceptance of digital banking and found that self-efficiency has a significant and positive impact on the behavioural intentions of using mobile banking. Huang and Ren (2020) found SE has a significant positive indicator of the planned for continued use intention of smartphone applications. Puthur et al. (2020) revealed that SE had a strong beneficial impact on citizens' desire to visit the IRCTC website for e-ticketing to make their travel more comfortable. Thakur (2018) found that SE has significantly and positively associated with continued usage intention of mobile shopping applications among 424 responses in India.

Besides, it is worth exploring how SE engages with core TAM frameworks/structures in forecasting the future use purpose of mobile travel apps. PEU is strongly connected to SE (Bandura, 2001), and there is justification to endorse technological SE also as a reliable indicator of PEU (Faqih and Jaradat, 2015; Leon, 2018). Gumussoy et al. (2018) found in their studies that SE has a positive and significant influence on PEU and PU of mobile banking applications use intention among 225 respondents in Turkey. Okcu et al. (2019) found SE has a significant positive impact on the PEU of big data technology. Leon (2018) found SE has a significantly positive association with PEU of service smartphone applications. Hence, the following hypothesis can be drawn from the above literature:

H4 SE is positively associated with young users' behavioural intention to use travel booking apps.

H5 SE is positively associated with PEU.

2.3.4 Social norm

According to SCT, the surrounding circumstance is among the main variables influencing a person's behaviour, and the social norm (SN) is a key component of this theory (Bandura, 1986). Individuals' behavioural change takes place in a spectrum of societal influences, comprising societal expectations and the actions of individuals in one's surrounding environment, such as family, acquaintances, peers, and people who lived in the local community (Bandura et al., 1999). When technology innovation is comparatively advanced, people may lack adequate information or experience to shape feelings about technology (Okumus and Bilgihan, 2014). As a consequence, the behavioural decision may be strongly affected by the beliefs of significant individuals (Lu et al., 2015). Venkatesh et al. (2012) describe SNs as the extent to where an entity interprets that related individuals such as parents, peer group, local community people assume (s)he should be used as a framework. According to El-Gayar et al. (2011), SN stimulates users' purchase intention and is considered as a strong predictor of such intentions (Ali et al., 2016). In other words, it represents the degree to which the perceptions, values, and actions of a person are affected by others (Wang et al., 2013). Nathan et al. (2020) investigated tourists' adoption of the Airbnb app when experiencing a historical location and stated that SNs have a substantial positive impact on travelers' behavioural willingness to adopt the Airbnb application. Kim (2016) found that if significant other consumers, such as family, community members, colleagues, and relatives, embrace the concept of having a hotel tablet application, the consumer would be more inclined to use the app. From the above-mentioned literature, it is assumed that SN has an impact on users' intention to use different mobile applications. Thus, it is possible to postulate the following hypothesis:

H6 SE is positively associated with young users' behavioural intention to use travel booking apps.

2.3.5 Trust

Trust (TRU) plays a significant role in influencing the behaviour of customers, such as buying intentions, continuing intentions, and the adoption of modern innovation (Kang and Namkung, 2019; Sarmah et al., 2017). Gefen et al. (2003b, p.308) codified trust as

"the expectation that other individuals or companies with whom one interacts will not take undue advantage of a dependence upon them". Oyedele and Simpson (2018) asserted that trust is a primary antecedent regarding customer willingness to engage in group practices. Previous research has demonstrated whether trust is indeed an essential factor in the implementation of emerging technology such as digital banking (Khalil and Pearson, 2007), online purchasing (Agag and El-Masry, 2016; Lu and Su, 2009), and transactions are relying on smartphone applications (Chung and Kwon, 2009; Noh and Lee, 2016). Kang and Namkung (2019) explored customers' trust in food service smartphone applications has significantly positive influences on continuances intention to use these apps. Amaro and Duarte (2015) found trust in internet-based travel purchasing has a significant positive effect on the internet-based travel buying intentions of 1732 internet users. Akroush et al. (2020) showed that trust in m-shops is an important antecedent of adoption intentions and behaviours toward using smart applications for shopping in emerging markets. Thus, the following hypothesis can be postulated:

H7 Trust is positively associated with young users' behavioural intention to use travel booking apps.

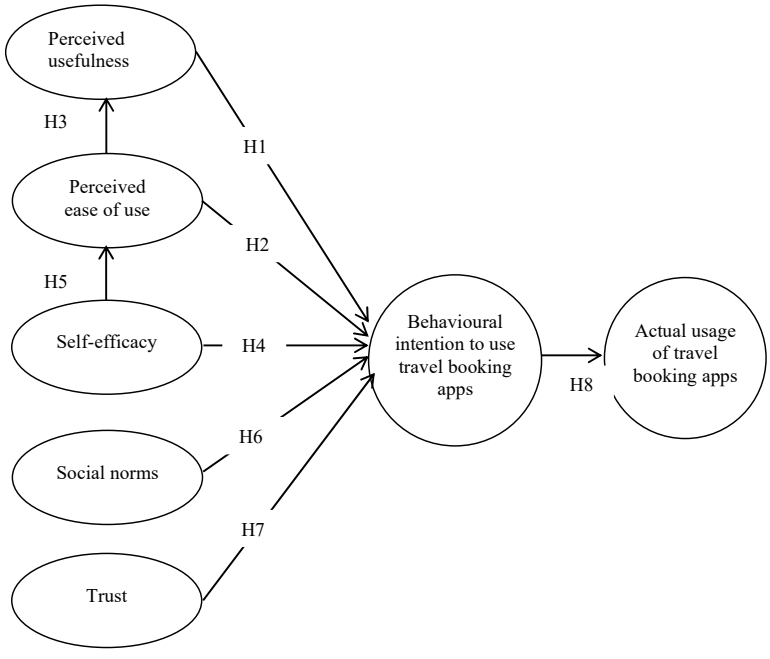
2.3.6 Behavioural intention and actual usage of travel booking apps

Behavioural intentions, including the use of technologies, can be impacted by means of access (the system used) (Boateng et al., 2016). Yu (2012) stated that an entity usage activity is inevitable in the context of behavioural practice. Henceforth, the influence of human behavioural motives on practical application is extensively discussed in the area of consumer behaviour (Venkatesh et al., 2012). The actual usage alludes to the representation of a measurable reaction to the objective in a predetermined setting (Ajzen, 1991). However, it is also evident that encouraging circumstances are a clear indicator of real usage (Barrane et al., 2018). The decision to use a travel booking application is correlated with a notion of the measurement of the intensity of an individual's desire to conduct a particular action (Lu et al., 2015). The aim to use mobile travel apps is an important indicator of the real behaviours where it is represented (Kaplanidou and Vogt, 2006). Various studies have investigated the association between intention and actual use/application of technology in multiple contexts (Ching-Ter et al., 2017; Park et al., 2012; Tantiponganant and Laksitamas, 2014; Venkatesh et al., 2012). Alshurideh et al. (2020) found that users'/customers' continual intention to use has a significant positive impact on their actual learning of online platforms. Ahmad et al. (2019) desired to explore the impact of e-service efficiency on the practical use of banking services via TAM and found that intention regarding e-banking has a significant positive impact on the practical application of e-banking. From the above research review, the following hypothesis can be drawn:

H8 Young users' behavioural intention to use mobile travel apps positively lead to the actual usage of travel booking apps.

Based on the proposed hypotheses, the conceptual model is outlined (Figure 1).

Figure 1 Conceptual model



3 Research methodology

3.1 Data collection

This study considers 386 participants, mainly consisting of service-holder, businessmen, and students residing in the urban areas of Chattogram in Bangladesh, who frequently booked a hotel, flight, or trip through travel apps. According to Krejcie and Morgan (1970), a study sample of 384 is adequate to population size is greater than 1,000,000. The research sample, therefore, seems to be sufficient for this analysis. Chattogram, the second most populated metropolitan city in Bangladesh, was considered apt for the survey as it is known as the commercial and tourism hub where people of various cultures, religions, education levels, and income groups reside here for their professional needs (Hassan, 2020; Mia et al., 2015). In this context, the inhabitants of this town will have the essence of travel since their childhood. The convenience sampling tool was used, and a survey questionnaire was circulated to all young consumers having smartphones and experience of using travel booking apps.

3.2 Survey instruments

Researchers used questionnaires for the collection of data and applied the convenience sampling method to extract samples from the target population. In order to extract valuable feedback and to validate the consistency and validity of the study, a preliminary conversation was held before the questionnaires were concluded between two academics

and eight professionals consisting of three tour guides, two hotel managers, and three IT professionals. After considering their thoughts, the survey instrument was revised and pre-tested involving 30 young tourists who used mobile travel apps while traveling abroad. The questionnaire was completed and circulated after checking the validity and consistency among the target audience. The questionnaire comprised nine sections, of which Section 1 is the screening questions, and Section 2 is the demographic information; the remaining seven sections have five Likert-scaled items from strongly agree to strongly disagree with measuring PU, PEU, SE, SN, TRU, INT, and AU. Table 1 illustrates the items and sources.

Table 1 Survey constructs

Construct dimension	*No. of items*	*Source*
Perceived usefulness (PU)	5 items	Adapted from Chen and Tsai (2019) and Venkatesh and Davis (2000)
Perceived ease of use (PEU)	5 items	Adapted from Chen and Tsai (2019)
Self-efficacy (SE)	4 items	Adapted from Zhang et al. (2017) and Lu et al. (2015)
Social norms (SN)	4 items	Adapted from Lu et al. (2015) and Antunes and Amaro (2016)
Trust (TRU)	5 items	Adapted from Muñoz-Leiva et al. (2017), Fogel and Nehmad (2009) and Noh and Lee (2016)
Behavioural intention to use mobile travel apps (INT)	4 items	Adapted from Chen and Tsai (2019) and Teo and Noyes (2011)
Actual usage behaviour (AU)	4 items	Adapted from Sek et al. (2010) and Moon and Kim (2001)

3.3 Common method variance

As the data generated by the same source from a single survey, the issue regarding common method variance (CMV) needs to be discussed. Out of a variety of approaches to address CMV, in this study, researchers have utilised Harman's single-factor test and exploratory factor analysis (EFA). In Harman's single-factor test, all measures described 30.4%, which was below 50% levels (Podsakoff et al., 2003; Schwarz et al., 2017). The second alternatives involved the application of the EFA with the maximum likelihood method along with varimax rotation. The findings provide seven parameter solutions, which clarified the overall variance of 55.5%. The first parameter was only 29.2%, which was significantly smaller (less than 50%) than the majority of the variance.

4 Results and data analysis

The theoretical model (Figure 3) was evaluated by utilising the partial least square modelling approach. In the estimation of parameters of measurement model as well as the structural model, utilising a two-stage method Smart PLS 3.0. PLS-SEM has been increasingly more prevalent in business research analysis in recent decades (Hair et al.,

2019). As a second-generation research instrument, PLS is commonly used to execute a two-phase analysis approach proposed by Chin (1998b), which initially started with testing the measurement model, later continuing to testing hypotheses explicitly. The structural model describes the conceptual paths between the structures, while the measurement models constitute the association and structure of the corresponding indicators (Sarstedt and Cheah, 2019). According to Hair et al. (2017a), bootstrapping methods with 5,000 resamples have been employed in the current study to determine the significance of path coefficients.

4.1 Demographic profile

Out of 520 survey respondents, 386 of which were initially retrieved. Out of the total respondents, 84 respondents were female (21.7%), and the rest portion consists of males (78.3%). Among the consumers surveyed, 62.9% belonged to the age group of 18–30 years. Most of the respondents were postgraduate (45.1%), and 39.6% of the total respondents were private service holders. The majority of the respondents (45.6%) had a household income between 30,000–50,000 per month. The basic characteristics of the survey respondents are presented in Table 2.

Table 2 Demographic profile

	Items	*Frequency*	*Percentage*
Gender	Female	84	21.76
	Male	302	78.24
Age	Under 20	31	08.03
	21–25	96	24.87
	26–30	116	30.05
	31–35	143	37.05
Employment status	Student	84	21.76
	Private service	153	39.64
	Govt. employee	62	16.06
	Business	87	22.54
Education	HSC level	57	14.77
	Bachelor level	147	38.08
	Master level	174	45.08
	MPhil/PhD level	8	02.07
Monthly income	Below 10,000	38	09.84
	10,000–30,000	121	31.35
	30,000–50,000	176	45.60
	Above 50,000	89	23.05

4.2 Measurement model

For determining the measurement model, convergent validity and discriminant validity are required (Hair et al., 2019), where convergent validity is defined as the degree to

which a high association exists between logically identical variables. It is the degree to which the construct links up to describe the variance of its components (Hair et al., 2013). It is calculated by composite reliability, factor loading, Cronbach's alpha, along with average extracted variance (AVE) for all objects in each structural component. A satisfactory AVE is 0.50 or greater, suggesting that a minimum of 50% of the variation of its objects is clarified by the variable (Hair et al., 2014). The loading factors of items above 0.6 are evaluated, while items with loading underneath the minimum threshold are rejected (Chin, 1998b; Henseler et al., 2009). The coefficient alpha of all constructions from Cronbach is identified to be greater than 0.6 and thus appropriate (Sekaran and Bougie, 2016). Again, the composite reliability is higher than 0.70 for the evaluation of construction reliability (Hair et al., 2019). According to Hair et al. (2019), the collinearity concern was examined prior to assessing the structural model, and probable VIF parameters were recorded to be below 3.5 for each predictor, suggesting no collinearity problem (Table 3).

Table 3 Reliability and validity

		Loading	*VIF*	α	*CR*	*AVE*
Perceived usefulness (PU)	PU 1	0.826	1.626	0.759	0.861	0.674
	PU 2	0.789	1.469			
	PU 3	0.847	1.535			
Perceived ease of use (PEU)	PEU 1	0.778	1.533	0.738	0.836	0.560
	PEU 2	0.782	1.525			
	PEU 4	0.714	1.373			
	PEU 5	0.717	1.381			
Self-efficacy (SE)	SE 1	0.655	1.202	0.685	0.809	0.516
	SE 2	0.690	1.257			
	SE 3	0.790	1.472			
	SE 4	0.731	1.337			
Social norms (SN)	SN 1	0.751	1.217	0.617	0.796	0.566
	SN 2	0.768	1.269			
	SN 3	0.738	1.194			
Trust (TRU)	TRU 2	0.788	1.807	0.824	0.883	0.653
	TRU 3	0.826	1.766			
	TRU 4	0.805	1.672			
	TRU 5	0.813	1.697			
Behavioural intention to use mobile travel apps (INT)	INT 1	0.779	1.728	0.791	0.865	0.615
	INT 2	0.797	1.783			
	INT 3	0.821	1.680			
	INT 4	0.738	1.395			
Actual usage (AU)	AU 1	0.730	1.385	0.807	0.874	0.635
	AU 2	0.842	1.952			
	AU 3	0.818	1.850			
	AU 4	0.793	1.806			

On the other hand, the degree to which a measure varies quantitatively from other structures in the research framework is regarded as discriminant validity and is defined by both Fornell-Larcker and HTMT. Fornell and Larcker (1981) proposed that the shared variance should not be greater than its AVEs for both models. Again, for HTMT ratio, a smaller, more moderate threshold value should be below 0.85 for quantitatively distinct and unique constructs (Henseler et al., 2015; Kline, 2016). According to the requirement, the present analysis was found to be appropriate and satisfactory for both criteria (Tables 4 and 5).

Table 4 Fornell-Larcker criterion

	PU	*PEU*	*SE*	*SN*	*TRU*	*INT*	*AU*
PU	0.821						
PEU	0.595	0.748					
SE	0.381	0.502	0.718				
SN	0.395	0.510	0.429	0.752			
TRU	0.384	0.488	0.488	0.373	0.808		
INT	0.466	0.610	0.563	0.513	0.560	0.784	
AU	0.365	0.489	0.443	0.545	0.353	0.503	0.797

Table 5 Heterotrait-monotrait ratio (HTMT)

	PU	*PEU*	*SE*	*SN*	*TRU*	*INT*	*AU*
PU							
PEU	0.784						
SE	0.528	0.706					
SN	0.572	0.759	0.655				
TRU	0.471	0.622	0.646	0.519			
INT	0.592	0.793	0.760	0.732	0.678		
AU	0.464	0.627	0.590	0.770	0.427	0.623	

4.3 Structural model

After having generated the structural model through measuring the model's validity and reliability, the next stage was to evaluate the structural model (Hair et al., 2014), where path coefficient, t-values, p-values along with the assessment of coefficient (R^2), predictive significance (Q^2) and effect size (f^2) are needed to be measured. From the study, all hypotheses are considered significant except for one.

The findings showed that behavioural intention to use mobile travel apps (INT) has a significantly positive impact on PEU (H2: $\beta2 = 0.252$, $t = 4.643$, $p < 0.001$), SE (H4: $\beta4 = 0.217$, $t = 4.150$, $p < 0.001$), SN (H6: $\beta6 = 0.174$ $t = 3.641$, $p < 0.001$) and TRU (H7: $\beta7 = 0.238$, $t = 4.986$, $p < 0.001$). Therefore, H2, H4, H6 and H7 were supported. Positive significant association was found between PEU and PU (H3: $\beta3 = 0.595$, $t = 12.197$, $p < 0.001$) indicating that H3 is accepted. SE's effect on PEU was also considered to be significant (H5: $\beta5 = 0.502$, $t = 9.712$, $p < 0.001$) through validating H5. Moreover, INT showed significant association with AU (H8: $\beta8 = 0.503$, $t = 8.450$, $p < 0.001$); H8 was acknowledged. However, the coefficient between PU and INT were

insignificantly associated (H1: $\beta 1 = 0.074$, $t = 1.368$, $p > 0.05$), which suggests H1 is not approved.

From the study, PEU is found significant with the PU. Again, PEU, SE, SN, and TRU are significantly related to behavioural intention to use mobile travel apps, which in turn found significant with actual usage towards travel booking apps. However, an insignificant relationship has been found between PU and behavioural intention towards using mobile travel apps (Table 6).

Table 6 Hypotheses testing

		Path coefficient	*SE*	*T statistics*	*p-values*	*Remarks*
H1	PU -> INT	0.074	0.054	1.368	0.17	Not supported
H2	PEU -> INT	0.252	0.054	4.643*	0.00	Supported
H3	PEU -> PU	0.595	0.049	12.197*	0.00	Supported
H4	SE -> INT	0.217	0.052	4.150*	0.00	Supported
H5	SE -> PEU	0.502	0.052	9.712*	0.00	Supported
H6	SN -> INT	0.174	0.048	3.641*	0.00	Supported
H7	TRU -> INT	0.238	0.048	4.986*	0.00	Supported
H8	INT -> AU	0.503	0.060	8.450*	0.00	Supported

Note: *Significant at the 0.05 level as t-value >1.96.

The coefficient of determination (R^2-value) is by far the most commonly used metric to evaluate the structural equation model. Although the required degree of R^2 is dependent on the individual statistical context, Falk and Miller (1992) recommended a minimal satisfactory R^2 of 0.10. Chin (1998a) suggests that R^2 scales consisting of 0.67, 0.33, and 0.19 can be categorised as high, moderate, and low in PLS-SEM. The R^2 estimates of endogenous structures are adequately described (Table 7).

Table 7 Assessment of R-square of endogenous latent constructs

	R^2	*R^2 adjusted*	*Effect*
INT	0.533	0.527	Moderate
PEU	0.252	0.250	Low
PU	0.354	0.353	Moderate
AU	0.253	0.251	Low

The current study examined the model's predictive relevance using the blindfolding method (Stone-Geisser's Q^2) to test the predictability of the research model (Henseler et al., 2009). If the Q^2 value is greater than 0, the model is considered predictive for any endogenous constructs (Cohen, 1988). Hair et al. (2017) opined that Q^2 values of 0.02, 0.15, and 0.35 reflect the minimal, medium, and high predictive importance of an exogenous model for an endogenous latent construct accordingly. The model is moderately predictable for PU, INT, and AU and to have small predictive significance for PEU, which means that exogenous constructs of this study are predictive for the endogenous variables in this study (Table 8).

Effect size evaluates the magnitude or intensity of the latent constructs and indicates how well the exogenous latent construct adds to the R^2 value of the endogenous variables (Wong, 2013). Cohen (1988) provided an interpretation of the standard effect sizes of

0.02, 0.15, and 0.35, reflecting minimal, medium, and high effects accordingly. The result findings show no impact of PU on INT, small-effect size of PEU, SE, SN, TRU on INT, the medium-size effect of SE on PEU, and INT on AU, and large-size effect of PEU on PU (Table 9).

Table 8 Assessment of predictive relevance (Q^2)

	Q^2	*Size*
PEU	0.137	Small
PU	0.231	Medium
INT	0.317	Medium
AU	0.157	Medium

Table 9 Assessment of effect size (f^2)

Constructs	f^2	*Effect size*
PU -> INT	0.007	No
PEU -> INT	0.067	Small
PEU -> PU	0.548	Large
SE -> INT	0.065	Small
SE -> PEU	0.336	Medium
SN -> INT	0.044	Small
TRU -> INT	0.082	Small
INT -> AU	0.339	Medium

4.4 Goodness of fit

In the study, the goodness of fit (GoF) was used as a benchmark for the whole model, which ensures that the model describes the empirical findings effectively through addressing both the measurement and the structural model with an emphasis on the overall model effectiveness (Henseler and Sarstedt, 2013). It constitutes the geometrical mean of both the average variance extracted (AVE) and R^2 of the endogenous constructs. The benchmark estimates for GoF, according to Wetzels et al. (2009) are suggested as:

a 0.36 or higher (substantial)

b within 0.1 and 0.25 (medium)

c 0.1 or below (low).

From the analysis, the GoF value was found 0.450, which is considerably larger than the threshold of 0.36.

5 Discussion

From the study, it is found that ease of use significantly influences PU while using travel booking apps. In the previous studies, it is also found relevant that there is a significant relationship between ease of use and PU (Hahn et al., 2014; Herrero and San Martín,

2012). Hahn et al. (2014) analysed the behavioural intentions of consumers who are frequent travellers using tourism apps and found that PEU positively and significantly influences the PU of tourism applications. Furthermore, from the study, PEU has been found the significant precursor of intention towards using mobile travel apps (Leon, 2018; Venkatesh and Davis, 1996), which is also justified from previous studies. Chen and Tsai (2019) defined PEU as the extent of difficulty of using technology, and they mentioned that when the difficulty seems lower, the platform is easy to function that eventually increases the individuals' intention of adopting the technology. Tam et al. (2020) wanted to explore the factors that influenced the continuance intention of using smartphone applications and found that PEU has a significant positive relationship with the intention of using smartphone applications. However, PU is found insignificant with behavioural intention towards travel booking apps. However, previous studies show different results (Kim, 2016; Lu et al., 2015).

Again, from the findings, it is evident that SE is significantly related to ease of use. PEU is strongly connected to SE (Bandura, 2001), and there is justification in the previous studies to endorse technological SE also as a reliable indicator of PEU (Faqih and Jaradat, 2015; Leon, 2018). Moreover, SE is also found significant with the intention, which is relevant to previous studies (Huang and Ren, 2020; Singh and Srivastava, 2018; Thakur, 2018). Trust is found to be significantly associated with intention towards using travel booking apps. In previous studies, trust has been found as an important predictor of intention. Agag and El-Masry (2016) and Bonsón Ponte et al. (2015) have been discovered the value of trust in encouraging buyer intentions to buy internet-based hospitality goods. Sarmah et al. (2017) found in their studies that travellers' trust in e-travel service providers has a significantly positive impact on their adaptation intention of using smartphone applications.

Regarding the intention of using travel booking apps, SNs were found significant. Numerous researchers confirm that the decision to use a method is greatly influenced by SNs (Al-Hunaiyyan et al., 2017; Eckhardt et al., 2009; Okumus et al., 2018). SN is the magnitude to which an organisation understands the value of how people feel that technology can be used (Chiu and Wang, 2008). Antunes and Amaro (2016) concluded that the SNs upon the adoption of smartphone applications have a substantial significant effect on the intention to use the application. The behavioural intention has a substantial positive effect on the actual usage of mobile travel apps, which is significant with previous studies (Ching-Ter et al., 2017; Sek et al., 2010). Dumpit and Fernandez (2017) found in their study greater intention to use social media significantly contributes to the real use of that system.

6 Theoretical contribution

This research has significant consequences for academics and professionals in the mobile app industry. Second, the TAM was implemented in previous studies with trust in evaluating consumer adoption of mobile travel applications. Very few research works were found, however, incorporating the TAM with SCT. The current study added substantially to the research by applying TAM with constructs from socio-cognitive theory to clarify customer acceptance intention towards mobile travel apps, as SNs and SE are valid predictors of the behavioural intention of young consumers to use travel booking apps. Secondly, the results confirmed and strengthened the value of trust to

consider young consumers' intention in the field of online travel. In addition, the findings legitimise the high explanatory effect of SCT in explaining the intention of young consumers to use mobile travel applications. The research was also necessary since no studies in previous literature explored young consumers' willingness to adopt mobile travel applications in developing countries.

7 Managerial contribution

Besides its theoretical aspects, this study also provides guidelines for app developers, particularly meta-search travel agents and the online market, along with policymakers in general. Firstly, to improve consumer involvement virtually in the online travel network, online travel app managers need to develop effective strategies to increase perceived user and customer interaction to strengthen behavioural intent towards mobile travel applications, eventually increasing user behaviour. Besides, online travel app managers can prioritise their focus, operation, and service distribution techniques to help young consumers develop trust and take specific courses of action needed to improve mobile travel apps' user behaviour. This can enhance young consumers' perception of mobile travel apps' features and help them make future purchase decisions. In addition to these factors, online travel firms and other concerned stakeholders related to this industry have to maintain customer attachment by directly influencing them and telling them that they are combinedly contributing to the advancement of improving technology; developing unique circumstances that contribute to the introduction of mobile travel apps and delivering the details in a manner that enhances the market for travel and improves it.

8 Limitations and future research directions

Although the research generates valuable insights, this study faces some limitations. Firstly, the analysis can be replicated in order to check its generalisation on some other sample respondents. Secondly, the study has limitations due to its consideration of TAM and SCT as the conceptual framework for this research, although assessing and evaluating with other behavioural theories for the study might provide a different scenario of travel apps adoption. Secondly, the finding of this study is primarily based on the context of developing countries, so the results in this study may be likely to vary considerably in other contexts or cultural influences. It is suggested to investigate the hypothesised relationships in cross-cultural contexts that could strengthen the existing understanding of travel apps usage in a multidisciplinary setting due to different cultures. Finally, the current research findings have employed a cross-sectional methodology to obtain responses from young customers due to inadequate time and resources. In the future, a longitudinal study is proposed to compare the outcomes in extended periods.

9 Conclusions

The current study has evaluated the impact of mobile travel apps on the tourism industry structure and how such sophisticated technology can generate a competitive advantage and achieve predetermined performance goals. Mobile travel apps have a tremendous

impact on the tourism industry structure, making it more competitive than ever before. Tourism companies that ignore embracing such smartphone applications will face significant threats from other companies that have adopted it for gaining strategic benefits. The ever-changing competitive tourism market also means that firms have no strategic choice but to embrace the mobile travel apps or risk losing out of the market. Although there are many challenges involved in the adoption of mobile travel apps technology, tourism companies should have the dynamic capability to take precautions to deal with them in a proactive manner. The success of many web-based tourism companies has invested in techno infrastructure by incorporating mobile travel apps to provide value-added services to tourists. The future of mobile travel apps software technologies is seen to be bright due to the changing tourists purchasing behaviours towards receiving quicker services, increased awareness, and the use of the internet. The opportunities and benefits of adopting mobile travel apps are incredibly beneficial rather than the risk of refusal to adopt them, so accepting the new platform is recommended.

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